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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/934,175	08/21/2001	Robert L. Canella	4323US (MUEI-0543.00/US)	7405

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EXAMINER

KIELIN, ERIK J

ART UNIT	PAPER NUMBER
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2813

DATE MAILED: 01/14/2003

13

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/934,175

Applicant(s)

CANELLA, ROBERT L.

Examiner

Erik Kielin

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-- The MAILING DATE of this communication appears on the cover sheet with the corresponding address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 November 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 9-18, 20-23 and 42-45 is/are pending in the application.
- 4a) Of the above claim(s) 42-45 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 9-18 and 20-23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 August 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 06 November 2002 is: a) ☒ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

This action responds to the proposed drawing changes (Paper No. 11) and the amendment (Paper No. 12) each filed 6 November 2002.

Election/Restrictions

1. Newly submitted claim 42-45 are directed to an invention that is independent or distinct from the invention originally claimed for the following reasons:

This application contains claims directed to the following patentably distinct species of the claimed invention:

- I. Substrate with various shapes of the seat portions of the aperture (Figs. 6-9).
- II. Springs with various shapes of the contact portion of the spring contact (Figs. 6-9).
- III. Substrates with the presence of a conductive trace on the top surface, bottom surface, or at an intermediate plane (Figs. 6-11).
- IV. Orientation of the conductive filler material along the wall of the aperture or to a certain depth (Figs. 6-11).
- V. Whether or not the aperture passes through the substrate or stops at some depth (Figs. 6-11).
- VI. Spring contact portions of various cross-sectional shape of the wire from which the spring was made (Figs. 12-14A).
- VII. The number of coils contacting the lead of the IC.
- VIII. The number of IC chips mounted to the substrate (Figs. 4 and 15).
- IX. The kind of IC lead (Figs. 12 and 16).

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X. The presence and nature of the clamping element.

In the first action on the merits, filed 26 July 2002, each of the species within each of the groups I, III, IV, V, and VII have already been considered. This constitutes the examination of a reasonable number of species.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 42-45 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Drawings

2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, “A substrate configured for operably connecting said IC device to at least one other IC device mounted on said substrate or at least one electrical component mounted on said substrate” as required in amended claim 9 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

3. The proposed drawing correction, filed on 6 November 2002 has been approved. A proper drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The correction to the drawings will not be held in abeyance.

INFORMATION ON HOW TO EFFECT DRAWING CHANGES

1. **Correction of Informalities -- 37 CFR 1.85**

New corrected drawings must be filed with the changes incorporated therein. Identifying indicia, if provided, should include the title of the invention, inventor's name, and application number, or docket number (if any) if an application number has not been assigned to the application. If this information is provided, it must be placed on the front of each sheet and centered within the top margin. If corrected drawings are required in a Notice of Allowability (PTOL-37), the new drawings **MUST** be filed within the **THREE MONTH** shortened statutory period set for reply in the "Notice of Allowability."

Extensions of time may NOT be obtained under the provisions of 37 CFR 1.136 for filing the corrected drawings after the mailing of a Notice of Allowability. The drawings should be filed as a separate paper with a transmittal letter addressed to the Official Draftsperson.

2. **Corrections other than Informalities Noted by Draftsperson on form PTO-948.**

All changes to the drawings, other than informalities noted by the Draftsperson, **MUST** be made in the same manner as above except that, normally, a highlighted (preferably red ink) sketch of the changes to be incorporated into the new drawings **MUST** be approved by the examiner before the application will be allowed. No changes will be permitted to be made, other than correction of informalities, unless the examiner has approved the proposed changes.

Timing of Corrections

Applicant is required to submit acceptable corrected drawings within the time period set in the Office action. See 37 CFR 1.185(a). Failure to take corrective action within the set (or extended) period will result in **ABANDONMENT** of the application.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims 9-18 and 20-23 are rejected under 35 U.S.C. 112, first paragraph, as containing

subject matter which was not described in the specification in such a way as to enable one skilled

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in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

The specification does not provide support for the newly added limitation to independent claim 9: “a substrate configured for operably connecting said IC device to at least one other IC device mounted on said substrate or at least one electrical component mounted on said substrate.”

The remaining claims are rejected for depending from claim 9.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 9-12, 14-16, 18, and 20-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6,229,320 B1 (**Haseyama et al.**).

Regarding claim 9, **Haseyama** discloses a device for establishing electrical contact between a lead element **28** (called “solder bumps” col. 10, line 38; Fig. 11) extending from an integrated circuit **25** (called “IC” col. 10, line 31) and a substrate which includes the parts labeled **23** (called “contact unit” col. 9, lines 23-24), **32** (called “test board” col. 6, line 1), and **36** (Fig 11; called “positioning plate” col. 11, line 32) comprising,

a substrate **23, 32, 36** configured for operably connecting said IC device **25** to at least one electrical component **33** mounted on said substrate;

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a spring contact **30** (called “contact pins” Figs. 6, 21A-21B, 23A) including a base portion **71, 72, 73** (Figs. 24A-24C) and a contact portion **63**, said contact portion **63** comprising a resiliently compressible coil spring configured to bias against and electrically contact said lead element **28** of said integrated circuit device **25** (col. 15, lines 32-53; col. 16, lines 17-25); and

an aperture **35** (called “through holes” col. 10, line 45; Fig. 11), **70** (called “through holes” col. 17, line 12; Figs. 24A-24C) opening onto one surface of said substrate **32** and extending a depth at least partially into said substrate **32**, said aperture **70** configured to receive and electrically contact said base portion **71, 72, 73** of said spring contact,

wherein the aperture **40, 70** includes a seat portion **38** (Fig. 11; called “positioning recesses” col. 10, lines 45-47) configured to receive said contact portion **63** of said spring contact, one end of said seat portion opening onto said one surface of said substrate **36**; and a retaining portion **31, 70** (Figs. 24A-24C) configured to receive the base portion **71, 72, 73** of the spring contact **30**, said retaining portion **31, 70** having a first end **31a** (Fig. 11, or as shown in Fig. 14B) connected to an opposing end of said seat portion **38** (or **53A** in Fig. 14B) and a second end **70** extending said depth into said substrate **36, 23, 32**. Note that Fig. 11 is shown in exploded view.

Further regarding the nature of the substrate, the claims do not presently require the substrate to be integrally formed. If it is thought that the claims, as presently drafted, somehow possess the limitation that the substrate is integrally formed, then this may be a difference. However, it has been held that the use of a one-piece construction instead of the separate pieces, would be merely a matter of obvious engineering choice. See *In re Larson*, 340 F.2d 965, 968, 144 USPQ 347, 349 (CCPA 1965) (A claim to a fluid transporting vehicle was rejected as

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obvious over a prior art reference which differed from the prior art in claiming a brake drum integral with a clamping means, whereas the brake disc and clamp of the prior art comprise several parts rigidly secured together as a single unit. The court affirmed the rejection holding, among other reasons, “that the use of a one piece construction instead of the structure disclosed in [the prior art] would be merely a matter of obvious engineering choice.”) In the instant case, it would be obvious to form the **Haseyama** exploded view substrate integrally, because the parts of the substrate are shown in direct contact with each other in, for example, the **Haseyama** Fig. 9.

Regarding claim 10, see Fig. 9, which shows that the aperture extends all of the way through the substrate portions **36**, **23** but not through **32**.

Regarding claims 11 and 15, a layer of conductive material or a volume of conductive filler **40** (Fig. 11; col. 10, lines 64-67), **70** (Figs. 24A-24C) is disposed on the interior wall of the aperture **35**, **70** and is therefore necessarily “in” the aperture and electrically contacts the base portion **71**, **72**, **73** of the spring contact **30**. Further regarding claim 15, it is noted that the claim does not limit from where the depth begins and ends. As shown in Hasegawa --as in Applicant’s Fig. 6, for example-- the depth is from the wall of the aperture inward.

Regarding claims 12, 14, 16, and 18, the conductive filler material **70** is electrically connected to conductive traces **70** formed on said one surface and the opposing surface of said substrate **32** (not separately labeled but shown as part of **70** in Figs. 24A-24C). Further regarding claims 14 and 18, the same Figs. 24A-24C show that the retaining portion of the aperture may open onto the opposing surface of the substrate **32**.

Regarding claim 20, the second end of said retaining portion **70**, opens onto an opposing surface of said substrate **36**, **23**, **32** as shown in Figs. 24A-24C.

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Regarding claim 21, the seat portion may be conically shaped (col. 10, lines 45-47). As shown in Fig. 14B, the seat portion **53A** is cylindrically shaped and is integral with the elastic member **31** which is part of substrate **23**.

Regarding claim 22, the seat portion **38** (or **53A**) is configured to at least partially align said lead element **28** of said IC device **25**.

8. Claims 13 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Haseyama** in view of Patent Application Publication US 2002/0075025 A1 (**Tanaka**).

The prior art of **Haseyama**, as explained above, discloses each of the claimed features except for indicating that the substrate has an “intermediate conductive plane,” which Examiner interprets to be exemplary shown in the instant Fig. 11, item **669**.

Tanaka, like **Haseyama**, teaches a semiconductor testing tool, and provides an “intermediate conductive plane,” (called “internal lead wires 8” in the Abstract), electrically connected to the conductive layer or conductive filler **7**, which beneficially reduces the number of structural elements of the test tool.

It would have been obvious for one of ordinary skill in the art, at the time of the invention to include “intermediate conductive plane,” as taught by **Tanaka**, in the substrate of **Haseyama** to beneficially reduce the number of structural elements, by providing embedded elements, as expressly taught by **Tanaka**.

9. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Haseyama** in view of JP 2000-123935 (**Kawaguchi**).

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The prior art of **Haseyama**, as explained above, discloses each of the claimed features except for indicating that the coil spring has at least two coils for contacting the lead elements.

Kawaguchi teaches a similar integrated circuit test tool to **Haseyama** wherein coil springs **20** (Figs 1 and 2) are used to make electrical contact to the lead elements **11** (solder bumps or conductive balls) of an integrated circuit **10**, and states in pertinent part (in the machine language translation) “this invention aims at offer of the contact pin which does not start the defective continuity by the poor contact, and the socket using this contact pin, without generating damage, when ... a conductive ball is contacted” (paragraph [0006]) and in solving the problem provides a contact pin having a contact section, “of the shape of a spiral by two or more number-of-turns sections of a coiled spring edge.”

It would have been obvious for one of ordinary skill in the art, at the time of the invention to use two or more coil turns as taught by **Kawaguchi** in the spring contact portion of **Haseyama** to prevent damage and provide better contact with the solder bumps, as expressly taught by **Kawaguchi**.

Response to Arguments

10. Applicant's arguments filed 6 November 2002 have been fully considered but they are not persuasive.

Applicant argues that Haseyama et al. does not teach “a substrate configured for operably connecting said IC device to at least one other IC device mounted on said substrate or at least one electrical component mounted on said substrate” (p. 9 of Response filed 6 November

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2002, Paper No. 12). Examiner respectfully disagrees. As noted above the IC device 25 electrically connects to the electrical components 33 on the test board portion 32 of the substrate.

Also on p. 9, Applicant argues that Haseyama does not teach the claimed “spring contact including a base portion and a contact portion” or the “aperture including a seat portion opening onto one surface of said substrate and a retaining portion having a first end connected to an opposing end of said seat portion and a second end extending a depth at least partially into said substrate, said seat portion of said aperture configured to receive said contact portion of said spring contact and said retaining portion of said aperture configured to receive and electrically contact said base portion of said spring contact.” Examiner respectfully disagrees as each of these features was noted above in the rejection.

Applicant argues that the “aperture structure for containing the spring contacts is formed directly in the substrate of the Applicant’s claimed invention.” Examiner disagrees that Applicant is claiming this feature. The claims, as presently written, do not require that the substrate be integrally formed. Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). Moreover, that the instant invention may be formed integrally --albeit not presently claimed-- would still be obvious for the reasons indicated in the rejection above.

Applicant argues that Examiner has used hindsight reasoning in combining various elements within the Haseyama reference alone to attain the instant invention, citing case law *Grain Processing Corp. v. American-Maize Prods. Co.* Examiner respectfully submits that the cited case law is inaccurately applied since the obviousness issues discussed therein (1) deal

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with combining plural references --not a single reference; and (2) concern a "patent in suit" over infringement -- not an application for patent. Moreover, Haseyama teaches each of the embodiments is usable with any other and nowhere suggests that some embodiments may not be combined with another. Accordingly, no such combination was made as alleged by Applicant. With Applicant's present line of reasoning, it further appears that Applicant is arguing that the various embodiments of the instant invention are not combinable with any other features not expressly shown already combined.

In the last paragraph on p. 10, Applicant argues that that Haseyama does not teach that the aperture does not extend only to a depth within the substrate. Examiner respectfully disagrees as this feature is taught in Haseyama as noted above with respect to amended claim 10, which was amended from its original form of extending all of the way through the substrate to its present form of extending only into some depth of the substrate.

For the sake of brevity, Applicant argues that each of the features of claims 12, 14-16, 18-22 are not taught without indicating why the features cited by Hasegawa do not meet the limitations. Accordingly, Examiner disagrees because each of these features is as noted above in the rejection and requires to further addressing until which time Applicant indicates why the indicated features do not meet the presently claimed limitations.

Applicant argues that claims 13 and 17 are not taught by the combination of Haseyama in view of Tanaka for previously argued reasons that Haseyama fails to teach the presently claimed features of independent claim 9. Additionally, Applicant argues that claim 23 is not taught by the combination of Haseyama in view of Kawaguchi for previously argued reasons that Haseyama fails to teach the presently claimed features of independent claim 9. Again Applicant has not

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indicated why the features noted by Examiner in the applied references fail to meet the claimed limitations. Accordingly, there are no further arguments for Examiner to address that have not already been addressed in the rejection above, wherein the featured alleged absent by Applicant are indicated to be present.

Conclusion

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication from examiner should be directed to Erik Kielin whose telephone number is (703) 306-5980 and e-mail address is erik.kielin@uspto.gov. The examiner can normally be reached by telephone on Monday through Thursday 9:00 AM until 7:30 PM.

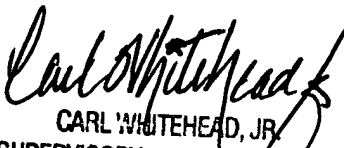
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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead, Jr., can be reached at (703) 308-4940 or by e-mail at carl.whitehead@uspto.gov. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9318 for regular communications and 703-872-9319 for After Final communications.

EK

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January 11, 2003


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